

## REFERENCES

- DUNBAR, R.I.M. (1988): *Primate Social System*. Cornell University Press, Ithaca, New York.
- MEDHI, R. (2002): Behaviour of Golden Langur *Trachypithecus geei* (Khajuria 1956), in a riverine island. Ph.D. dissertation (Unpublished), Gauhati University, Assam, India.

## 3. AN UPDATE ON THE ELEPHANTS OF INTERVIEW ISLAND

**Introduction**

Elephants were brought over to the Andaman Islands for forestry operations. One such forestry operation was carried out on Interview Island, west of Mayabunder on Middle Andaman Island. Since the company carrying out the operation went bankrupt, the elephants being used were released on the island in 1962. Approximately 40 elephants were released then (Sivaganesan 1993).

Elephants are not normally found in the Andamans. Interview Island is predominantly evergreen and semi-evergreen forest and has an area of 133.87 sq. km (Fig. 1)

according to the Forest Department (Anon 1998). However, this calculation is based on the low tide line; the area under vegetation is around 105 sq. km. A percentage of this is under mangrove, which is not used by elephants. Sivaganesan and Kumar (1995) estimated the available habitat for elephants to be around 70 sq. km.

In 1992, Sivaganesan and Kumar (1995) conducted a census of these elephants using dung counts. The numbers estimated were around 70 animals. This indicates a phenomenal growth in population. Considerable damage to the vegetation was recorded during this study, raising concerns about the future of this population. I therefore carried out another survey in 2001.

Local information gathered in December 2000 indicated that elephants were found in herds of 5-10 individuals (Andrews, pers. comm.). It was established that their movements over the island was highly seasonal, with certain areas being preferred at certain times of the year. Their movements were also constrained by the proximity of water since there were limited perennial waterholes on the island. Nine major waterholes were identified on Interview Island, and the herds moved from waterhole to waterhole. *Machans* were therefore built in January near six of these waterholes.

The survey began on February 16 and continued until the end of March. There were 35 census days in this period. Only the days when new individuals were sighted have been shown in the tables. Because of the heavy rains preceding this period, it was found that observations from *machans* were not yielding much information (since water was available at many sites). Experienced trackers were then employed to quarter the forests, locate individual herds and follow them while trying to identify as many individuals as possible. It was expected that the rate of detection of new animals would level off as more and more were found: this did in fact happen. No new elephants were seen after the 17<sup>th</sup> day.

A check sheet with the frontal and lateral views of elephant was developed, where identifying features such as pale patches and scars were marked. The trackers were interviewed in-depth each day, and an understanding of elephant movement on the island during that period was gained.

Grid locations were not used, since at that time there was no accurate method of estimating precise locations on

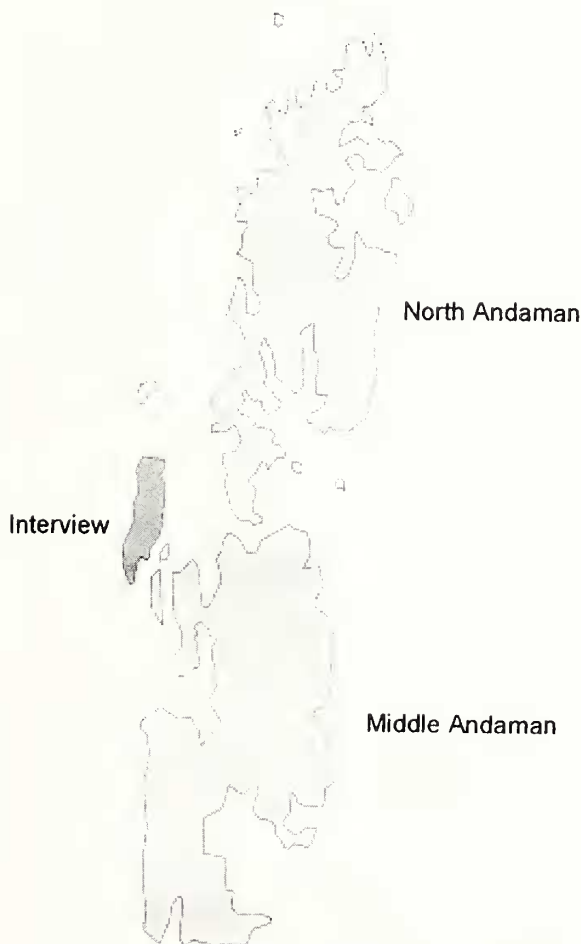


Fig. 1: Map of Northern part of Andaman Islands showing Interview Island

**Table 1:** Sighting of elephant groups on Interview Island during the study period

Date	Location	Herd						Unattached adult Males			Total
		AM	AF	SF	JM	JF	J?	Calves	Single	Groups	
17 February	Papita Dera	2	5	3	1	1	2	2	0	0	16
19 February	3 km West of FRH		2					1	0	0	3
22 February	1 km West of FRH		1	1			1		0	0	3
24 February	Tochi nullah	1	1	2			1		0	0	5
03 March	Asay Saka	2	1				1		0	0	4
Total		5	10	6	1	1	5	3	0	0	31

AM = Adult male, AF = Adult Female, SF = Subadult Female, JM = Juvenile Male, JF = Juvenile Female, J? = Juvenile unsexed

the island. However, names given by the local residents were used. The age categories used were calf (0.9-1.2 m), juvenile (1.2-1.8 m), sub adult (1.8-2.4 m) and adult (more than 2.4 m). Since there were few animals and they were in herds, ambiguity was minimized.

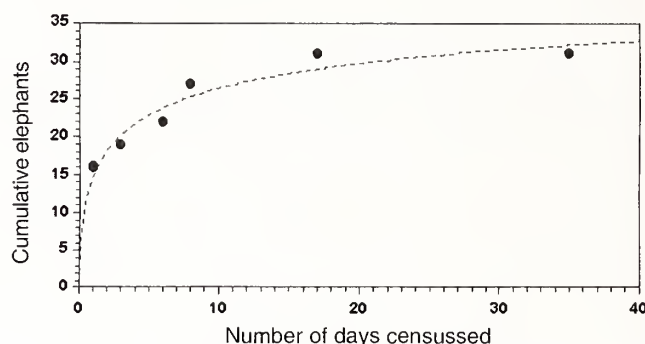
Table 1 shows elephant sightings over time. A total of 31 elephants were counted. No new sightings were made after the 17<sup>th</sup> day, and it is expected that the number will not exceed 35. The small number made individual identification possible, hence capture-recapture analysis techniques using a few identifiable individuals were not required.

Of the ones counted there were 5 adult males, and 10 adult females. The rest were either sub adults or juveniles. This contrasts with Sivaganesan's (1993) finding that there were about 70 elephants. Figure 2 plots number of elephants sighted against number of days of observation, and it can be seen that the number of elephants plateaus out between 30 and 35.

The differences found between this study and Sivaganesan's needs to be explained. The earlier study used dung transects combined with defecation and decay rates, and a census for dung of only those areas that had concentrations of elephant was conducted. This could have biased the counts towards areas that had more elephants, leading to the higher density count.

Since the elephants were found to be highly seasonal, a short study would not eliminate bias due to seasonal movement. Also, estimates based on dung introduce variations due to individual animals and changes in diet. Their use would best suit long-term studies, preferably after population numbers are validated using some other method.

A second possibility is that both the methods have yielded accurate estimates and there has been a population decline. One possibility is that there has been poaching; another is that the habitat has degraded and cannot support the elephant population. In fact, there is some support for

**Fig. 2:** Number of elephants seen with days censused

this point of view. The third possibility that elephants have dispersed to other islands can be ruled out since there are no new sightings on the neighbouring islands.

Of the total adult males seen, 3 were tuskers and 2 were *makhnas*. The single juvenile male seen was a tusker. Sample sizes are too small to perform meaningful analysis to see if there is any difference. The lack of sightings of sub adult males is probably an artefact of the small sample size.

The vegetation damage described by Sivaganesan has now become worse. This is discussed in detail elsewhere (Ali *et al.* in prep.) There was practically no bamboo, cane or *Pandanus* seen anywhere on the island, and these were not sampled in the transects. Several species of trees found debarked during this study were not recorded as eaten earlier. An analysis of the vegetation, which will be presented separately, indicates that as trees die they are unlikely to regenerate due to browsing by Chital (*Axis axis*) – another introduced species.

The condition of many of these elephants seems emaciated. These elephants are invasives and as they are outstripping the food supply of the Island, the logical management recommendation is their removal from the island. Culling is one such option; translocation to the mainland after trapping is another.

## ACKNOWLEDGEMENTS

This study was funded by Andaman & Nicobar Island Environmental Team. The Department of Environment & Forests, Andaman & Nicobar Administration commissioned this study. Dr. Alok Saxena, Chief Wildlife Warden and Mr. Graham Durai made facilities on Interview Island available. Uncle Pamwint and Allen Vaughn provided company and help in the field. Harry Andrews, Ravi Sankaran and Cheryl Nath discussed many aspects of this study with me; I hasten to

add that the views expressed are my own.

March 6, 2003

RAUF ALI

Andaman & Nicobar Island Environmental Team,  
North Wandoor, South Andaman Island.

For correspondence: Post Bag 1,  
Junglighat P.O., Port Blair 744 103,  
Andaman Islands, India.  
Email: rauf@vsnl.in

## REFERENCES

- ANON (1998): Forestry Statistics, 1997-1998. Dept. of Environment and Forests, Andaman & Nicobar Administration, Port Blair.
- ALI, R., B. AUL & S. KRISHNAN (UNDER PREP): The impact of introduced herbivores on vegetation in the Andaman Islands.
- SIVAGANESAN, N. (1993): Report to the Andaman & Nicobar Forest

Department. SACON, 1993.

SIVAGANESAN, N. & AJITH KUMAR (1995): Status of feral elephants in Andamans. Pp. 97-119. In: A Week with Elephants: Proceedings of the International Seminar on the Conservation of Asian Elephants (Edited by Daniel, J.C. & Hemant Datye). Bombay Natural History Society.

#### 4. STATUS AND DISTRIBUTION OF GREY GORAL (*NAEMORHEDUS GORAL*) AND SEROW (*CAPRICORNIS SUMATRAENSIS*) IN KUMAON HIMALAYAS, UTTARANCHAL, INDIA

## Introduction

Of the three species of goat antelopes in India, the Grey Goral (*Naemorhedus goral*) and the Serow (*Capricornis sumatraensis*) – are found in Kumaon Himalayas (Prater 1997). The Grey Goral is widely distributed from low to medium altitude, while the Serow is restricted to higher altitude zones. The Kumaon Himalayas comprising Almora, Pithorgarh and Nainital districts in Uttar Pradesh, India, cover an area of about 21,000 sq. km. (28° 43' 55"–30° 30' 12" N and 78° 44' 30"–80° 45" E) (Fig. 1). They were once covered with extensive tracts of oak forest (*Quercus* spp.), but clearance of forest and changes in land use pattern by man during the last two centuries have led to the fragmentation of the oak forest. Large areas have been replaced either with Chir Pine (*Pinus roxburghii*) or terrace cultivation.

The large-scale changes in the Kumaon Himalayas have impacted the animal community, especially the goat antelopes. The populations of goat antelopes have been confined to small oak patches and no information is available on the present status and distribution of the two species in Kumaon Himalayas. Considering this we conducted extensive surveys throughout the Kumaon Himalayas to document the present status of the Grey Goral and the Serow in extant oak patches.

## Study area

The Kumaon Himalayas present a variety of habitat types ranging from moist deciduous forests at lower

altitudes in the Siwalik hills to alpine meadows at higher reaches of the Himalayan mountains. Extensive tracts of

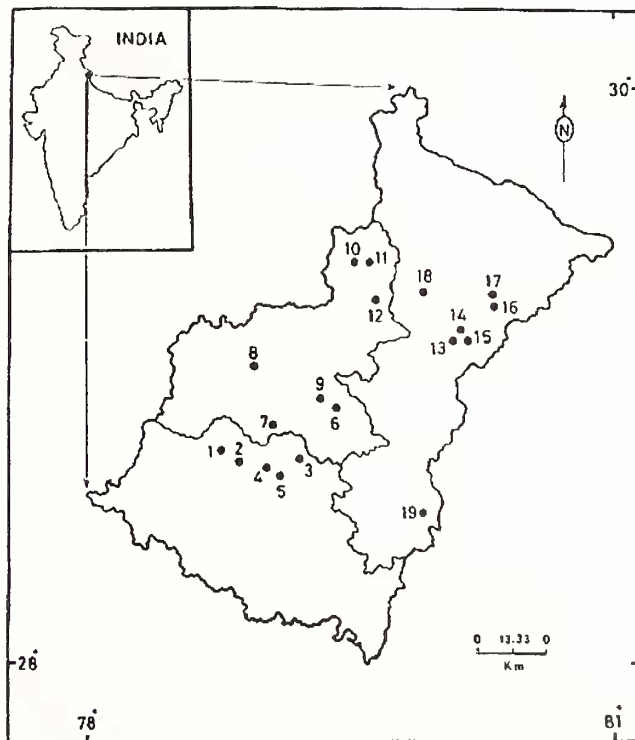


Fig. 1: Map showing location of the surveyed sites